



ASIIN Seal

Accreditation Report

Bachelor's Degree Programmes

Engineering Mechanics

Engineering Physics

Natural Resources and Environmental Management

Provided by

Ho Chi Minh University of Technology

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A About the Accreditation Process

Name of the degree program (in original language)	(Official) English translation of the name	Labels applied for ¹	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC) ² (will be completed by ASIIN)
Cơ Kỹ thuật	Engineering Mechanics	ASIIN	AUN-QA (ASEAN University Network) 23.10.2015 – 22.10.2019	TC01
Vật lý Kỹ thuật	Engineering Physics	ASIIN	None	TC05, TC13
Quản lý Tài nguyên và Môi trường	Natural Resources and Environmental Management	ASIIN	None	TC 11
Date of the contract: 2022-09-14 Submission of the final version of the self-assessment report: 2022-03-15 Date of the onsite visit: 29 March until 1 April 2022 at: online				
Peer panel: Prof. Dr. Leonhard Ganzer, Technical University Clausthal Prof. Dr. Otto Iancu, University of Applied Sciences Karlsruhe Prof. Dr. Jens Schuster, University of Applied Sciences Kaiserslautern Due to an illness the student peer has to cancel his participation.				
Representative of the ASIIN headquarter: Dr. Michael Meyer				

Responsible decision-making committee: Accreditation Commission for Degree Programmes	
Criteria used: European Standards and Guidelines as of 15.05.2015 ASIIN General Criteria as of 28.03.2014 Subject-Specific Criteria of Technical Committee 01 – Mechanical Engineering as of 28.09.2012; of Technical Committee 05 – Physical Technology as of 09.12.2011; and of Technical Committee 11 – Geosciences as of 09.12.2011.	

B Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	b) Areas of Specialization	c) Corresponding level of the EQF ¹	d) Mode of Study	e) Double/Joint Degree	f) Duration	g) Credit points/unit	h) Intake rhythm & First time of offer
Engineering Mechanics	Bachelor of Engineering Mechanics		Level 6	Full time	--	8 Semester	129 Vietnamese Credits	2019
Engineering Physics	Bachelor of Engineering Physics	Biomedical Engineering	Level 6	Full time	--	8 Semester	129 Vietnamese Credits	2019
Natural resources and Environmental Management	Bachelor of Natural resources and Environmental Management		Level 6	Full time	--	8 Semester	130 Vietnamese Credits	2019

For the Bachelor's degree programme Engineering Mechanics the institution has presented the following profile in the diploma supplement and the self-assessment report:

Graduates

Have the ability to apply knowledge of mathematics, science and engineering to be able to identify, describe and solve engineering mechanics problems.

- Have the ability to apply engineering mechanics knowledge to solve problems related to the health of engineering structures, fields of the cultural and social and economic and global environment.

- Have the ability to communicate in a technical environment, effectively in teamwork, and be ethically responsible for the profession.

- Have the ability to design real and virtual experiments, have the ability to analyse data of a system or manufacturing process of products in the field of mechanical engineering.

¹ EQF = The European Qualifications Framework for lifelong learning

B Characteristics of the Degree Programmes

- Have the ability to control data and produce results in order to ensure safety and efficiency in engineering.

- Have the ability to search and read technical documents to find new information to supplement the knowledge and solve technical problems.

Have a basic knowledge of mathematics and natural sciences.

Knowledge and skills in engineering foundation and profession: Having engineering and career base knowledge.

Professionalism: Having the ability of critical thinking, personal and professional skills, communication, teamwork, and professional ethics.

Society knowledge: Having an understanding in a broad economic, political, social context.

For the Bachelor's degree programme Engineering Physics the institution has presented the following profile in the diploma supplement and the self-assessment report:

Graduated student will gain the following:

- Ability to apply knowledge of mathematics, basic science and engineering to solve engineering physics problems.

- Ability to design, guide and document experiments and test procedures for applied engineering physics systems. Capable of measuring acquisition, analysis and interpretation of physical experimental data.

- Capable of designing systems, equipment and processes for physical and technical measurement to meet the specifications of interdisciplinary applications in the practical conditions of Vietnam. Having professional consulting skills in system construction, equipment selection and technology in engineering physics.

- Ability to work in multidisciplinary teams including scientists, technicians, and other experts outside of engineering physics.

- Ability to identify, formulate and solve engineering physics problems, interdisciplinary engineering fields related to physics.

- Ability to independently improve self-knowledge and effective oral or written communication presentation skills.

- Ability to acquire and use modern equipment, skills and tools necessary for careers related to engineering physics.

Science knowledge: Having a solid knowledge at the undergraduate level with intensive orientation into interdisciplinary applications.

Knowledge in engineering foundation and profession: Being able to design and perform experiments in the field of engineering physics and interdisciplinary applications.

Professional skills: Being able to participate actively in teamwork; to acquire long-term knowledge about ethic and social values.

International communication: Being able to use English fluently in learning, research, and communication, particularly in engineering physics fields.

For the Bachelor's degree programme Natural Resources and Environmental Management the institution has presented the following profile in the self-assessment report:

Objective 1. To apply general knowledge of mathematics, natural sciences, technology, and management in the field of natural resources and environmental management for solving concerning issues in their professional practices.

Objective 2. To perform skills in analysis and evaluation by applying approaches and solutions to environmental issues effectively, efficiently, and sustainably.

Objective 3. To work independently and to pursue higher education in the area of natural resources and environmental management.

Objective 4. To have a good understanding and recognition of contemporary issues in politics, legislation, society and career ethics.

Objective 5. To have a fully equipped communication skill, teamwork, and foreign language (English)

C Peer Report for the ASIIN Seal

1. The Degree Programme: Concept, content & implementation

Criterion 1.1 Objectives and learning outcomes of a degree programme (intended qualifications profile)

Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The auditors base their assessment of the learning outcomes as provided in the Self-Assessment Report of the three Bachelor's degree programmes under review. The university also add links to the websites but these were only available in Vietnamese.

The auditors refer to the Subject-Specific Criteria (SSC) of the Technical Committees Mechanical Engineering, Physical Engineering and Geosciences as a basis for judging whether the intended learning outcomes of the Bachelor's degree programmes as defined by HCMUT correspond with the competences as outlined by the SSC. They come to the following conclusions:

The peers remark that the objectives defined for all programmes are very generic and do not show the specific profile of the programmes compared to other programmes of the three disciplines. Nevertheless, the peers interpret the objectives in regard to the SSC.

The peers determined that graduates of the Bachelor's degree programme should gain extensive technical knowledge as to engineering, mathematics and natural science with a view to mechanical engineering and an understanding of the multi-disciplinary context of Engineering Sciences. In the formulated objectives of the university, the peers recognise as well that graduates should be qualified to identify, formulate and solve problems peculiar to mechanical engineering, to analyse and assess products, processes and methods used in their discipline and to choose suitable methods of analysing, modelling, simulating and optimising and apply them. Additionally the peers recognise that graduates should have the

ability the ability to conceive designs for machinery, devices, EDP programmes or processes and to develop them according corresponding to the status of their knowledge. Regarding transferable skills graduates should be able to work in teams, to communicate effectively and to be aware of the health, safety, legal issues and responsibilities of engineering practice and of the impact of engineering solutions in a societal and environmental context.

For the Bachelor's degree programme in Engineering Physics the panel determines that graduates should know and comprehend the principles of natural sciences, engineering, technology and mathematics that are the basis of the subject area of their focal studies. They should be able to apply their knowledge and comprehension to conduct developments according to predefined and specific requirements and have learned fundamental development and planning methods. They should be capable of carrying out literature and data research and should be in a position to select and apply the necessary and suitable methods. Finally, graduates should be able to work in teams, to communicate effectively with the engineering or scientific community and should be aware of the methods and limitations of project management and business practice.

For the bachelor's degree programme in Natural resources and environmental management the peers interpret the objectives formulated by the university in a way that graduates should have basic knowledge and understanding of the natural sciences (Physics, Chemistry, Mathematics) underlying the study of Geology, be aware and understand the temporal and spatial dimensions in Earth processes and be aware of the applications and responsibilities of Geosciences and its role in society including its environmental aspects. Additionally, they should know the economic, social, environmental and legal conditions expected in professional practice and to be able to communicate effectively in written and verbal form with colleagues, other professionals, customers and the general public.

The auditors hold the view that the objectives and intended learning outcomes of all degree programmes under review are reasonable. They learn that employers were involved in the development of the programmes by giving feedback on the content of the degree programmes. In addition, there is an alumni organisation. The peers appreciate that HCMUT stays in contact with its alumni and has a close relation with its partners from the industry.

In summary, the auditors are convinced that the intended qualification profiles of the three programmes under review allow students to take up an occupation, which corresponds to their qualification. The peers conclude that the objectives and intended learning outcomes of the degree programmes adequately reflect the intended level of academic qualification and correspond sufficiently with the respective ASIIN Subject-Specific-Criteria.

Criterion 1.2 Name of the degree programme

Evidence:

- Self-Assessment Report

Preliminary assessment and analysis of the peers:

The auditors confirm that the English translation and the original Vietnamese names of all degree programmes under review correspond with the intended aims and learning outcomes as well as the main course language (Vietnamese).

Criterion 1.3 Curriculum

Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Webpage HCMUT: www.hcmut.edu.vn
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The curricula of all programmes contents beside the specific module general courses about physical education, Marxist-Leninist philosophy and political economy, Ho Chi Mins ideology and history of Vietnamese Communist Party. Up to four English courses are integrated in all programmes and modules about Humans and environment and about Vietnamese law as well.

Besides this the curriculum of the bachelor's degree programme in Engineering Mechanics contents in the first semesters basics in mathematics, natural sciences and engineering like Calculus 1-2, Linear Algebra, General Chemistry and General Physics, Introduction to Engineering, Engineering Drawing. Starting with the third semester the fundamentals of mechanics are handled like Numerical Methods, General Mechanics, Engineering Mechanics, Fluid Mechanics, electrical and Electronics Engineering, theory of Elasticity, Solid Mechanics, Engineering Design and Materials Engineering. From the sixth semester the fundamentals are applied in a Project of Engineering Design and in modules like Fundamentals of Vibrations, Finite Element Methods, a workshop for Engineering Mechanics, Theory of En-

Engineering Plasticity and Non-Electric Quantities Measurement. In the sixth semester an internship of eight weeks is implemented as well. In total five elective courses are implemented in the curriculum. The theses is written in the eighth semester (8 ECTS-Points).

The peers determine that the content of the programme is relatively theoretical oriented and in general the modules handled the contents more theoretically. Nevertheless, students get indeed sufficient practical experiences from the point of view of the peers.

Out of the discussion with students the panel learns that the courses are taught at different campuses of HMCUT and that the current study plan does not take into account the travelling time from one campus to the other. Therefore students have some issues to reach the start of several courses in time. From the point of view of the peers it is necessary to consider in the timetable for the students the time needed to come to the other campus. For example it would be helpful if courses at one day are taught only on one campus.

The curriculum of the bachelor's degree programme in Engineering Physics contents in the first semesters also basics in mathematics, natural sciences and engineering like Calculus 1-2, Linear Algebra, General Chemistry and General Physics, general Biology, Introduction to Engineering and Engineering Drawing. From the third semester the fundamentals of engineering physics are handled like Numerical Methods, Fundamentals of Quantum Mechanics, Fundamentals of Biomedical Engineering, Applied Mechanics, Probability and Statistics, Electrical and Electronics Engineering, Medical Imaging, Fluid Mechanics, Introduction to Fortran, Informatics for Engineering Physics, Medical Instrumentation, Fundamentals of General Medicine and Fundamentals of Computational Physics. Starting with the sixth semester the fundamentals are applied in two Projects of Basic and Advanced Design and in modules like Sensors and Measurement, Biomechanics, Data Visualisation, Engineering Optics and Fundamentals of Nuclear Physics. In the sixth semester an internship of eight weeks is implemented as well. In total five elective courses are implemented in the curriculum. The theses is written in the eighth semester (8 ECTS-Points).

The peers determine that the curriculum is designed really interdisciplinary concentrating on biomedical engineering and computational physics. For that reason they understand that the university chose the more general term of "Engineering Physics" instead of "Biophysics" as title of the programme.

From the point of view of the peers both engineering programmes are structured very well. Out of the discussion with representative of the industry the peers got the impression that graduates of the programmes are very well prepared for the national labor market regarding their field specific competences. Overall the peers come to the conclusion that the cur-

ricula of both programmes implement the intended learning outcomes in a very good manner. From their point of view the curricula are linked to the actual field specific research discussions and students are well prepared for

The curriculum of the bachelor's degree programme in Natural Resources and Environmental Management contents in the first semesters also basics in mathematics, natural sciences and engineering like Calculus 1-2, General Chemistry and General Physics, Microbiology, Introduction to Engineering, Engineering Drawing. From the third semester the specific fundamentals are handled like Probability and Statistics, Analytical Chemistry, Chemistry for Environmental engineering, Ecology, Environmental Law and Policy, Environmental Hydrology, Environmental Processes, Air Pollution Control, Solid and Hazardous Water Management, Environmental Systems Analytics, GIS, Water and Wastewater Treatment and Risk Assessment. Starting with the sixth semester the fundamentals are applied in Semester Paper, an excursion and modules like Environmental Management, Water Resources Management. In the sixth semester an internship of eight weeks is implemented as well. In total five elective courses are implemented in the curriculum. The theses is written in the eighth semester (8 ECTS-Points).

The peers determine that in the curriculum the field of environmental management is structured very well and implements the intended learning outcomes in a very good manner.

On the other side the peers discuss with the programme coordinators the reasons to add in 2017 "natural resources" to the title of the programme. They determine that the curriculum is concentrated on water and only few other natural resources are offered in some elective courses like forestry management. The peers do not see any treatments of geological resources or wind energy. Therefore the term "Natural" resources used in the title and the objectives of the programme seems to be too broad comparing with the content of the curriculum. For the peers it is necessary either to adapt the title and objectives to the natural resources which are treated in the curriculum (water) or to broaden the curriculum with further natural resources.

Nevertheless, the peers see very good chances for graduates on the labor market, as the structure and content of the curriculum regarding water resources creates a profile which is needed by respective companies.

The peers discuss the practical experiences of the students in all programmes. They appreciate that the university implemented internships in all programmes but questioning whether the duration of 8 weeks could give students an impression about the practical application of their abilities gained in the study programmes. They understand that this duration is a compromise between the needs of the industry and the opportunities in the

curriculum. Nevertheless, they recommend to increase practical experiences of the students by extended internships

Although there are four modules about English language implemented in the bachelor's curriculum, after the discussion with the students the peers get the impression that their English skills could be increased, for example by teaching technical courses in English as well.

Criterion 1.4 Admission requirements

Evidence:

- Self-Assessment Reports
- Webpage HCMUT: www.hcmut.edu.vn
- Discussions during the audit

Preliminary assessment and analysis of the peers:

According to the Self-Assessment Report, admission for three undergraduate programmes is conducted once a year in September of each year. Information about the admission procedure is described in the Advisory Book for the University Admission and on the website of Academic Affairs Office and thus accessible for all stakeholders. In addition, HCMUT provides support on admission requirements and procedures for high school students. An admission committee is established by the Rector of HCMUT each year to manage all admission issues. High school graduates can join HMCUT through one of the following five admission paths:

1. National University Competency Assessment Test
2. Annual National University Entrance Exam.
3. Priority for admission according to the regulations of VNUHCM, candidates who are good students from 149 specialized/gifted high schools and high schools possessing the highest annual National University Entrance Exam average score.
4. Direct admission according to the regulations of the Ministry of Education and Training, candidates who won the National Excellent Student Prize, the National Science and Technology Prize.

5. Admission to Vietnamese and foreign candidates graduating from international high schools (Australia, USA, Canada, etc.).

Every summer, the Vietnamese Ministry of Education and Training (MOET) will organise the Annual National Entrance Exam. All high school students in Vietnam must take part at this exam. It covers several subjects, such as Mathematics, Foreign Languages, Physics, Chemistry, Literature, and History and lasts 3 - 4 days. Based on the score in the exam and on their preferences, prospective students get admitted to the different universities.

In addition, the two National Universities in Ha Noi and Ho Chi Minh conduct their own admission exam the so called National University Competency Assessment Test. The National Universities have introduced this test in order to give high school graduates another chance to get admitted to university.

Most of the students of the international programmes at HCMUT are admitted via paths 1 and 2 (around 45 % each).

Since 2019, the tuition fee is fixed and the same for all semesters and all undergraduates programmes at FCE. It is 5.850.000 VND (225 €) per semester for the regular programmes.

The Academic Affairs Office awards scholarships to the students with excellent performance based on the student's academic performance. Students with very good results (top 10% GPA of their respective intakes at their Faculty) can receive scholarships in the following semester.

In addition, HCMUT has a policy to award tuition fee waivers for five different groups of students. (1) students with meritorious services to the revolution or the relatives of people with meritorious services to the revolution; (2) students who are orphaned by both parents; (3) Students with disabilities in poor or near-poor households; (4) students of ethnic minorities in poor or near-poor households; (5) students of very few ethnic minorities.

In summary, the auditors find the terms of admission to be binding and transparent. They confirm that the admission requirements support the students in achieving the intended learning outcomes.

2. The degree programme: structures, methods and implementation

Criterion 2.1 Structure and modules
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Evidence:

- Self-Assessment Report
- Study plans of the degree programmes
- Module descriptions
- Discussions with programme coordinators, teaching staff and students

Preliminary assessment and analysis of the peers:

The structure of the programmes under review is clearly outlined on the subject specific website for each study programme. The programmes consists of modules, which comprise a sum of teaching and learning. The module descriptions are also published on the subject specific website. Based on the analysis of the sequence of modules and the respective module descriptions the peers concluded that the structure of both programmes ensures that the learning outcomes can be reached. The programmes also offers several elective courses, which allows students to define an individual focus. Based on the analysis of the curriculum and the module descriptions the peers confirmed that the objectives of the modules and their respective content help to reach both the qualification level and the overall intended learning outcomes.

Considering the high number of elective courses offered in the catalogues the peers wonder whether students get any support for their selection. They recommend to structure the elective catalogues for example by specializations.

Regarding the sequence of modules in the bachelor's degree programme in Engineering Mechanics they remark some editorial inconstancies in the module descriptions and the curriculum table which have to be overworked.

International Mobility

HCMUT provides opportunities for students to conduct internships and exchange programmes abroad. To this end, several Memorandums of Understanding (MOU) have been signed with international universities and in addition, the International Relation Office participates in international programmes such as Erasmus. This allows students to sign a learning agreement and to transfer credit points from foreign university to HCMUT. According to a regulation from the Ministry of Education and Training, a course taken at an international university can be considered equivalent to a course at the home university by a Scientific Academic Committee. As a member of Viet Nam National University Ho Chi Minh City, students of HCMUT can benefit from the mechanism of ASEAN Credit Transfer System, which was established to reduce the barriers for students' academic mobility.

The peers determined that the number of students participating in international exchange programmes is still low despite students' high interest. The students confirm during the discussion with the peers that some opportunities for international academic mobility exist. However, they also point out that they wish for more places and better endowed scholarships for long and short-term stays abroad. The number of available places in the exchange programmes is still limited and there are restrictions due to a lack of sufficient financial support. HCMUT can only provide limited travel grants, while the demand from students is rising. The lack of financial support hinders students from joining the outgoing programmes.

The peers understand these problems but it would be helpful from their point of view to establish more international co-operations and exchange programmes and by offering more and better-endowed scholarships in order to increase the internationalisation of HCMUT.

Criterion 2.2 Work load and credits
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Evidence:

- Self-Assessment Reports
- Study plans of the degree programmes
- Module descriptions
- Academic Guidelines
- Discussions during the audit

Preliminary assessment and analysis of the peers:

In the Vietnamese system, each credit is equivalent to 15 periods of theoretical lecture in class or 30 periods of practical laboratory work with additional 30 periods of self-study. In the internship, the design project and the Bachelor's thesis, it is equivalent to 60 periods. One period lasts for 50 minutes. The workload calculation is depicted in the following table:

Form of study for 1 credit	In-class periods	Self-study periods	Total Periods	Total hours
Theoretical Lecture	15	30	45	37.5
Practice in a Laboratory	30	30	60	50
Project, Thesis, Internship	60		60	50

Due to this calculation, there cannot be the same conversion rate between Vietnamese credits and ECTS points for all courses. For theoretical lectures, the rate would be 1 to 1.25 and for practical work 1 to 1.67. In total HCMUT calculates 258 ECTS points for the EM programme, 158 for the EP programme and 260 for NREM.

Regarding the bachelor's degree programme in Engineering Mechanics the peers determine some inconsistencies in the transfer from Vietnamese credit points to ECTS points as it is calculated in the same rate for all modules. The university has to ensure that the transformation of national credit points into ECTS is oriented on the workload defined for the different courses.

As the total workload in all programmes is a little higher than the regular workload calculated in the ECTS the peers assess whether there is an overload for the students. Comparing to the objectives and the content of the courses the workload defined for the single modules seems to be realistic for the peers. The students confirmed this impression. The fact that half of the graduates finish their studies in four years and the other half within one additional year shows for the peers that students are able to handle the workload without problems. Only 20-25% of the beginners leave the university without graduation.

Criterion 2.3 Teaching methodology

Evidence:

- Self-Assessment Reports
- Study plans of the degree programmes
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The staff members of HCMUT apply various teaching and learning methods like interactive lecture, small group discussion, demonstration, collaborative learning, discussion, case study, project based learning, laboratory practice, presentation and software simulation. In some module smaller projects and presentations are implemented in order to train the ability for teamwork and the communication skills.

For the internships students have to write a report and the supervisor of the company evaluate the students' performance as well. Each two weeks there is a feedback meeting between the students and the university supervisor. The faculty members have close contacts to industry and suggest companies to students who may select them regarding their interests.

In summary, the peer group considers the teaching methods and instruments to be suitable to support the students in achieving the intended learning outcomes. In addition, they confirm that the study concept of all three undergraduate programmes comprises a variety of teaching and learning forms as well as practical parts that are adapted to the respective subject culture and study format. It actively involves students during the projects in the design of teaching and learning processes (student-centred teaching and learning).

Criterion 2.4 Support and assistance

Evidence:

- Self-Assessment Reports
- Academic Handbooks
- Discussions during the audit

Preliminary assessment and analysis of the peers:

HCMUT offers a comprehensive advisory system for all undergraduate students. Students in the same intake year are organised into classes and every class has an academic advisor. If a class has more than 60 students, it may require more than one academic advisor. The role of the academic advisor is to help the students with the process of orientation during the first semesters, the introduction to academic life and the university's community, and to respond promptly to any questions. They also offer general academic advice, make suggestions regarding relevant careers and skills development and help if there are problems with other teachers. The students confirm during the discussion with the peers that they all have an academic advisor.

The academic advisors organise at least two meetings in each term for the classes they are supervising. For the International Class, the academic advisors often set up three meetings for students' supervision every semester.

From the third year, students will have a lecturer directly supervising them on the projects and the Bachelor's thesis. Each lecturer supervises 5 - 7 students and organises weekly meetings with them.

Students can receive assistance from the Student Services & Career Centre of HCMUT about career guidance and consultancy, career development training, soft skill training, and job opportunities. The Centre provides information on training and job seeking to help students develop career plans and workplace understanding. The Centre is also a bridge between students, staffs, lecturers and businesses in searching for scholarships, factory visits, internships, and employment opportunities. It is also responsible for keeping in contact

with alumni associations, employers, and professional organizations. In addition, HCMUT support its graduates to find suitable jobs by annually conducting a job fair and by forwarding job vacancies to the students. Moreover, during the internship students are introduced to professional life and acquire additional skills that help them finding an adequate position after graduation. In summary, this results in good job perspectives for the graduates of all three undergraduates.

Finally, there are several student organizations at HCMUT; they include student's activity clubs, which are divided into arts, sports, religious and other non-curricular activities.

The peers notice that there are enough resources available to provide individual assistance, advice and support for all students. The support system helps the students to achieve the intended learning outcomes and to complete their studies successfully and without delay. The students are well informed about the services available to them. In summary, the comprehensive tutorial and support system for students is one of the strong points of the degree programmes.

3. Exams: System, concept and organisation

Criterion 3 Exams: System, concept and organisation
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Evidence:

- Self-Assessment Report
- Module descriptions
- Examination regulations

Preliminary assessment and analysis of the peers:

According to the Self-Assessment Report, the students' academic performance is evaluated based on their attendance and participation in class, their laboratory works and reports, assignments, homework, project works, presentations, mid-term exam, and the final exam at the end of each semester. In general, exams are written tests. But in several courses also oral presentations of lab reports or homework are required. Also group discussions and practical exams in courses with high laboratory practice are conducted. In several courses students have to pass laboratory practice before entering the final exam. The form and length of each exam is mentioned in the module descriptions.

The written exams can be multiple choice, quizzes, or essays. In addition, there are oral exams. The students are informed about mid-term and final exams via the Academic Calendar. The final grade is the result of the different activities in the course.

At the beginning of the semester, students get all information related to the courses and exams from their academic advisor and can access the information via the digital platform BKeL. At the end of the semester, students can also access their grades via BKeL.

As described in the Academic Guidelines, students who are not satisfied with their grade may appeal to the Academic Affairs Office for reevaluation within five school days from the time that the grade is announced.

Students who fail a course must attend the course again in the next semesters. The number of repetitions is unlimited. Students who have passed a course and want to improve the score, may also take the course again.

All three degree programmes include a Bachelor's thesis (graduation project), which is conducted independently under the guidance of one or more supervisors. It consists of literature study, practical research, and data analysis. Both the student and his /her supervisors might decide the topic and content of the project. In many cases, lecturers offer particular topics connected to their research.

The peers also inspect a sample of examination papers and final theses and are overall satisfied with the general quality of the samples. The requirements in the exams, projects and theses correspond for the auditors with the qualification level of the programmes.

4. Resources

Criterion 4.1 Staff

Evidence:

- Self-Assessment Reports
- Staff Handbooks
- Study plans
- Module descriptions
- Discussions during the audit

Preliminary assessment and analysis of the peers:

At HCMUT, the staff members have different academic positions. There are professors, associate professors, and lecturers. The academic position of each staff member is based on research activities, publications, academic education, supervision of students, and other supporting activities.

According to the Self-Assessment Report, currently there are one full professor, two associate professors, seven PhDs, three masters and one engineer involved in the Engineering Mechanics programme, while in the Engineering Physics programme one full professor, four associate professors, twelve PhDs and seven Masters are teaching. The programme in natural resources is taught by two associated professors, 15 PhDs and 10 masters.

The peers wondered that there is now full professor currently responsible for the bachelor's programme in natural resources and they appreciate the implementation of a development plan to increase the number of full professors.

HCMUT expects staff members to conduct research activities and has issued a policy, which offers some financial support for publishing papers in international journals. In addition, students are encouraged to participate actively in scientific research activities.

Every year, associate professors or lecturers can apply for promotion to full professor, respectively. The criteria of the positions are described by the Board of Professor Consideration based on years of working, hours of teaching graduate students, quantity and quality of scientific published papers.

In summary, the peers confirm that the composition, scientific orientation and qualification of the teaching staff are suitable for successfully implementing and sustaining the degree programmes.

Criterion 4.2 Staff development

Evidence:

- Self-Assessment Reports
- Staff handbook
- Discussions during the audit

Preliminary assessment and analysis of the peers:

HCMUT encourages training of its academic and technical staff for improving the didactic abilities and teaching methods. As described in the Self-Assessment Reports, faculty members regularly participate in training or workshops.

Faculty members can also further develop their competencies through several activities such as post-doctoral programmes, training, workshops, joint research, etc. Moreover, they are encouraged to present their research papers in national and international conferences, and to collaborate with colleagues from international universities.

The peers discuss with the members of the teaching staff the opportunities to develop their personal skills and learn that the teachers are satisfied with the internal qualification programme at HCMUT, their opportunities to further improve their didactic abilities and to spend some time abroad to attend conferences, workshops or seminars.

In summary, the auditors confirm that HCMUT offers sufficient support mechanisms and opportunities for members of the teaching staff who wish for further developing their professional and teaching skills.

Criterion 4.3 Funds and equipment

Evidence:

- Kooperationsverträge und Regeln für interne/externe Kooperationen legen die hochschulinterne Zusammenarbeit sowie Kooperationen mit externen Institutionen fest.
- Dokumente aus dem täglichen Gebrauch der Hochschule, in denen die Ausstattung dargestellt wird, z.B. Laborhandbücher, Inventarlisten, Finanzpläne

Preliminary assessment and analysis of the peers:

Ho Chi Minh City University of Technology was a member of Vietnam National University – Ho Chi Minh City (VNUHCM), which is a ministerial-level university and becoming an autonomous university in the last year. Until than basic funding of the degree programmes and the facilities is provided by HCMUT and the Faculty. The financial sources are government funding, tuition fees from students, and industry funding (third party financing). Since it become an independent university the total budget regarding governmental funding is not defined finally. But it is already obviously that the public funding will decrease and the university will need additional student fees and increased industry funds.

As the financial situation seems not clarified finally yet for the peers it seems to be necessary to provide a concept how to ensure a reliable and safe budget after becoming an autonomous university.

From the provided documents and videos of the laboratories, the peers deduct that there seem to be no severe bottlenecks in the education of the two bachelor programmes in engineering due to missing equipment or a lacking infrastructure. The basic technical equipment for teaching the students is available, although it is not state of the art in all cases. The students confirm during the discussion with the peers that, in general, they are satisfied with the available equipment, but several instruments are outdated. For the bachelor's degree programme in natural resources there are only few information in the provided documents and especially the situation of geological laboratories stays unclear for

the peers. To get a final impression about the equipment of the labs in all programmes an onsite visit of some peers will be necessary to assess the technical infrastructure, safety measures, and facilities onsite at HCMUT.

The students express their satisfaction with the library and the available literature. The library offers direct access to international literature, scientific journals, and publications e.g. via ScienceDirect and Springer Online. From the students' point of view, there is sufficient access to current international literature and databases and a remote access is possible. In addition, it is possible to access all resources of all member universities of the Vietnam National University Ho Chi Minh City so that it is possible to get books from other universities if HCMUT does not have them.

5. Transparency and documentation

Criterion 5.1 Module descriptions

Evidence:

- Self-Assessment Reports
- Module descriptions

Preliminary assessment and analysis of the peers:

The students, as all other stakeholders, have access to the module descriptions via HCMUT's Vietnamese homepage.

The peers confirm for the bachelor's degree programmes in Engineering Mechanics and Engineering Physics that the module descriptions are given all needed information.

For the bachelor's degree programme in Natural Resources and Environmental Management the peers determine that the quality of the descriptions is quite different; some descriptions are very extended and for some modules the intended learning outcomes stay unclear while in other descriptions the Bloom's taxonomy is used for the objectives.

For the students the descriptions should be more comparable for what the peers find it necessary to overwork the module handbook. For NREM.

Criterion 5.2 Diploma and Diploma Supplement

Evidence:

- Self-Assessment Reports

- Sample Diploma for each degree programme
- Sample Diploma Supplement for each degree programme

Preliminary assessment and analysis of the peers:

The peers confirm that the students of all degree programmes are awarded a Transcript of Records, a Diploma and a Diploma Supplement after graduation. The Diploma Supplement and the Transcript of Records contain almost all necessary information about the respective degree programme. However, some information should be added. The Diploma Supplement should also include statistical data about the distribution of final grade according to the ECTS Users' Guide. This allows the reader to categorise the individual result.

Criterion 5.3 Relevant rules

Evidence:

- Self-Assessment Reports
- Webpage HCMUT: www.hcmut.edu.vn
- Webpage Faculty of Chemical Engineering: che.hcmut.edu.vn

Preliminary assessment and analysis of the peers:

The auditors confirm that the rights and duties of both HCMUT and the students are clearly defined and binding. All rules and regulations are published on the university's Vietnamese website and hence available to all stakeholders. In addition, the students receive all relevant course material in the language of the degree programme at the beginning of each semester.

However, the peers notice that the English websites of the programmes do not include much information. Regarding international recognition it would be helpful to update the English websites of the programmes, to align the information on the university's and the faculty's webpages, and to include information about the intended learning outcomes, study plans, module descriptions, and academic guidelines of each degree programme and make them thus available to foreign stakeholders as well.

6. Quality management: quality assessment and development

Criterion 6 Quality management: quality assessment and development

Evidence:

- Self-Assessment Reports
- Academic Guidelines
- Discussions during the audit

Preliminary assessment and analysis of the peers:

The auditors discuss the quality management system at HCMUT with the programme coordinators and the students. They learn that there is a continuous process in order to improve the quality of the degree programmes and it is carried out through internal and external quality assurance.

At university level, the Office of Quality Assurance manages the processes of internal quality assessment. In order to further improve its degree programme, HCMUT conducts several surveys, such as a stakeholder surveys for work related issues, a lecturer survey, an alumni survey (one year after graduation, a final year students survey (on the overall quality of programmes and services), and a students' survey (every semester).

Since 2013, the Quality Assurance Office conducts online-surveys about the lecturers' satisfaction with the degree programme and the curriculum. The feedback is collected, analysed, and reported to the Rector's Board of HCMUT. Based on the survey results, HCMUT can issue policies about organisation, academic issues, and finances to meet the needs of the lecturers.

As HCMUT and FCE are aware of the diversity of the labour market and the fast development of new technologies, employer surveys are conducted annually. Employers are asked about the ability of alumni to apply fundamental and professional skills into engineering practice. For each skill, employers are asked about their level of expectation for graduates and how these expectations are met. The employers' feedbacks is considered by the Board of Deans to modify or update the degree programme and teaching methods.

At the end of each semester, the Quality Assurance Office conducts a students' survey about the teaching quality of lecturers for each course. Before 2013, the course evaluation surveys were paper-based. Since 2013, the course evaluation surveys have been carried out online. Participation at the questionnaires is compulsory for the students, otherwise they cannot access their account on BKeL. The Quality Assurance Office analyses the data and sends the results to FCE and relevant lecturers. If the results shows that a lecturer has not met the teaching quality requirements, the lecturer is reminded to improve the teaching quality. If a lecturer, who has already been reminded before, does not meet the teaching quality again, FCE may stop assigning the course to the lecturer.

F Summary: Peer recommendations

According to the regulation “Survey of Students for Each Course”, after receiving feedback from the students, the Quality Assurance Office should send an email to confirm to students that their opinions have been received. Then, the office asks the relevant faculty to answer on the students’ opinion. In case, there is a plan to improve the programme, the plan should be sent to the Quality Assurance Office and the office should send this plan to the students for notification. After the plan is done, the relevant Faculty must report the results to the Quality Assurance Office, which forwards them to the students.

Meetings between students and representatives of the Board of Rectors, Board of Deans, Heads of Departments, and academic advisors are annually conducted at the beginning of the second semester (around March every year).

The peers are impressed by the outstanding quality management system. They confirm that the comprehensive quality management system at HCMUT is one of the strengths of the university and is suitable to identify weaknesses and to improve the degree programmes.

D Additional Documents

No additional documents needed

E Comment of the Higher Education Institution

The university abstains from commenting the report.

F Summary: Peer recommendations

The peers recommend the award of the seals as follows:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Engineering Mechanics	With requirements for one year		30.09.2027

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Engineering Physics	With requirements for one year		30.09.2027
Ba Natural Resources and Environmental Management	With requirements for one year		30.09.2027

A) Accreditation with or without requirements

Requirements

- A 1. (ASIIN 4.3) It is necessary to visit and assess the technical infrastructure, safety measures, and facilities onsite at HCMUT.
- A 2. (ASIIN 4.3) Provide a concept how to ensure a reliable and safe budget after becoming an autonomous university.
- A 3. (ASIIN 5.2) The Diploma Supplement needs to include statistical data about the distribution of final grade according to the ECTS Users' Guide.

For the Bachelor Engineering Mechanics

- A 4. (ASIIN 2.1) Ensure that the information about the position of single courses in the curricula correspond in the module descriptions and the curricula tables.
- A 5. (ASIIN 1.3) The weekly course schedule must consider the travel time required to get from one campus to the other (or try to reduce the courses offered at different campuses)
- A 6. (ASIIN 2.2) Ensure that the transformation of national credit points into ECTS is oriented on the workload defined for the different courses.

For the Bachelor Programmes Natural Resources and Environmental Management and Engineering Physics

- A 7. (ASIIN 1.3) Ensure that the programme-title, objectives and curriculum correspond to each other regarding the natural resources.

A 8. (ASIIN 5.1) A well structured module handbook has to be published for all stakeholders.

Recommendations

For all degree programmes

- E 1. (ASIIN 2.1) It is recommended to structure the elective courses by specialisations.
- E 2. (ASIIN 2.1) It is recommended to further promote the academic mobility of the students.
- E 3. (ASIIN 1.3) It is recommended to increase practical experiences of the students by extended internships (more than 8 weeks with according credit points).

G Comment of the Technical Committees

The involved Technical Committees discuss the procedure and follow the assessment of the peers without any changes.

H Decision of the Accreditation Commission

Assessment and analysis for the award of the ASIIN seal:

The Accreditation Commission discusses the procedure and follows the assessment of the peers and of the Technical Committee without any changes.

The Accreditation Commission decides to award the following seals:

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Engineering Mechanics	With requirements for one year		30.09.2027
Ba Engineering Physics	With requirements for one year		30.09.2027

Degree Programme	ASIIN-seal	Subject-specific label	Maximum duration of accreditation
Ba Natural Resources and Environmental Management	With requirements for one year		30.09.2027

Requirements

- A 1. (ASIIN 4.3) It is necessary to visit and assess the technical infrastructure, safety measures, and facilities onsite at HCMUT.
- A 2. (ASIIN 4.3) Provide a concept how to ensure a reliable and safe budget after becoming an autonomous university.
- A 3. (ASIIN 5.2) The Diploma Supplement needs to include statistical data about the distribution of final grade according to the ECTS Users' Guide.

For the Bachelor Engineering Mechanics

- A 4. (ASIIN 2.1) Ensure that the information about the position of single courses in the curricula correspond in the module descriptions and the curricula tables.
- A 5. (ASIIN 1.3) The weekly course schedule must consider the travel time required to get from one campus to the other (or try to reduce the courses offered at different campuses)
- A 6. (ASIIN 2.2) Ensure that the transformation of national credit points into ECTS is oriented on the workload defined for the different courses.

For the Bachelor Programmes Natural Resources and Environmental Management

- A 7. (ASIIN 1.3) Ensure that the programme-title, objectives and curriculum correspond to each other regarding the natural resources.
- A 8. (ASIIN 5.1) A well structured module handbook has to be published for all stakeholders.

Recommendations

For all degree programmes

- E 1. (ASIIN 2.1) It is recommended to structure the elective courses by specialisations.
- E 2. (ASIIN 2.1) It is recommended to further promote the academic mobility of the students.
- E 3. (ASIIN 1.3) It is recommended to increase practical experiences of the students e.g. by extended internships (more than 8 weeks with according credit points).

I Fulfilment of Requirements

Requirements

For all degree programmes

- A 1. (ASIIN 4.3) It is necessary to visit and assess the technical infrastructure, safety measures, and facilities onsite at HCMUT:

Initial Treatment	
Peers	fulfilled Vote unanimous Justification: One peer visited the laboratories at HCMUT and found the equipment adequate to the needs of the study programmes.
TC 01	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.
TC 05	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.
TC 11	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.

- A 2. (ASIIN 4.3) Provide a concept how to ensure a reliable and safe budget after becoming an autonomous university.

Initial Treatment	
Peers	fulfilled/ Vote: unanimous Justification: The university submitted the autonomy plan according to the Circular No. 56/2022/TT-which calculates the budget of the university in a reasonable way.
TC 01	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.
TC 05	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.
TC 11	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.

- A 3. (ASIIN 5.2) The Diploma Supplement needs to include statistical data about the distribution of final grade according to the ECTS Users' Guide.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: The examples of Transcripts of Records/Diploma supplement now includes statistical data regarding the final grades.
TC 01	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.
TC 05	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.
TC 11	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.

For the Bachelor Engineering Mechanics

- A 4. (ASIIN 2.1) Ensure that the information about the position of single courses in the curricula correspond in the module descriptions and the curricula tables.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: The updated Module Handbook is in accordance with delivered EM Curriculum. Group B optional subjects are placed in the 6. Semester according to the EM Curriculum. In the Module Handbook it is marked that they are also taught in the 6. Semester.
TC 01	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.
TC 05	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.
TC 11	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.

- A 5. (ASIIN 1.3) The weekly course schedule must consider the travel time required to get from one campus to the other (or try to reduce the courses offered at different campuses)

Initial Treatment	
Peers	fulfilled/ Vote unanimous Justification: All courses taught on the same day are conducted at the same campus.
TC 01	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.
TC 05	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.
TC 11	fulfilled Vote unanimous

0 | Fulfilment of Requirements

	Justification: The Technical Committee follows the assessment of the peers.
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- A 6. (ASIIN 2.2) Ensure that the transformation of national credit points into ECTS is oriented on the workload defined for the different courses.

Initial Treatment	
Peers	fulfilled vote: unanimous Justification: The student workload of 25 hours per 1 ECTS is now defined in all syllabuses.
TC 01	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.
TC 05	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.
TC 11	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.

For the Bachelor Programmes Natural Resources and Environmental Management

- A 7. (ASIIN 1.3) Ensure that the programme-title, objectives and curriculum correspond to each other regarding the natural resources.

Initial Treatment	
Peers	fulfilled Vote: unanimous Justification: The university add courses regarding natural resources into the curriculum. Therefore, objectives and curriculum correspond to each other
TC 01	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.
TC 05	fulfilled Vote unanimous Justification: The Technical Committee follows the assessment of the peers.
TC 11	fulfilled

0 | Fulfilment of Requirements

	<p>Vote unanimous</p> <p>Justification: The Technical Committee follows the assessment of the peers.</p>
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A 8. (ASIIN 5.1) A well-structured module handbook has to be published for all stakeholders.

Initial Treatment	
Peers	<p>fulfilled</p> <p>Vote: unanimous</p> <p>Justification: The updated module handbooks revised after my visit at HCMUT Mai 17, 2023 are well-structured. They are published on the homepage: has.hcmut.edu.vn for EM, EP and NREM. There no more inconsistencies in the module handbooks regarding the student workload.</p>
TC 01	<p>fulfilled</p> <p>Vote unanimous</p> <p>Justification: The Technical Committee follows the assessment of the peers.</p>
TC 05	<p>fulfilled</p> <p>Vote unanimous</p> <p>Justification: The Technical Committee follows the assessment of the peers.</p>
TC 11	<p>fulfilled</p> <p>Vote unanimous</p> <p>Justification: The Technical Committee follows the assessment of the peers.</p>

Draft resolution for the AC Programmes on 23.06.2023:

Degree programme	ASIIN-label	Subject-specific label	Accreditation until max.
Ba Engineering Mechanics	All requirement fulfilled		30.09.2027
Ba Engineering Physics	All requirement fulfilled		30.09.2027
Ba Natural Resources and Environmental Management	All requirement fulfilled		30.09.2027

Appendix: Programme Learning Outcomes and Curricula

The following **curricula** are presented:

1. CURRICULUM OF ENGINEERING MECHANICS PROGRAMME (EM)

No.	ID	Course's name	Number of credits	ECTS
		(English translation)		
Semester 1				
1	LA1003	English 1	2	4
2	MI1003	Military training	0	0
3	PE1003	Physical Education 1	0	0
4	MT1003	Calculus 1	4	8
5	CH1003	General Chemistry	3	6
6	AS1001	Introduction to Engineering	3	6
7	PH1003	General Physics 1	4	8
Sum of sem. 1			16	32
Semester 2				
1	MT1007	Linear Algebra	3	6
2	CI1003	Engineering Drawing	3	6
3	PH1005	General Physics 2	4	8
4	PH1007	General Physics Labs	1	2
5	MT1005	Calculus 2	4	8
6	PE1005	Physical Education 2	0	0

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7	LA1005	English 2	2	4
Sum of sem. 2			17	34
Semester 3				
1	LA1007	English 3	2	4
2	AS2013	Applied CAD	3	6
3	ME1003	General Mechanics	3	6
4	AS1003	Engineering Mechanics	3	6
5	PE1007	Physical Education 3	0	0
6	MT1009	Numerical Methods	3	6
7	SP1031	Marxist - Leninist Philosophy	3	6
Sum of sem. 3			17	34
Semester 4				
1	LA1009	English 4	2	4
2	CI2003	Fluid Mechanics	3	6
3	SP1033	Marxist - Leninist Political Economy	2	4
4	EE2011	Electrical and Electronics Engineering	3	6
5	AS2011	Theory of Elasticity	3	6
6	MT2013	Probability and Statistics	4	8
Sum of sem. 4			17	34
Semester 5				
1	SP1035	Scientific Socialism	2	4
2	AS3147	Solid Mechanics	3	6
3	AS2021	Engineering Design	3	6
4	AS2015	Engineering Mechanics Workshop 1	1	2
5	MA3077	Materials Engineering	3	6

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6	-	Group A optional subjects	3	6
Sum of sem. 5			15	30
Semester 6				
1	SP1039	History of Vietnamese Communist Party	2	4
2	AS2031	Project of Engineering Design	2	4
3	AS3061	Fundamentals of Vibrations	3	6
4	AS3015	Finite Element Method in Engineering Mechanics	3	6
5	AS3011	Engineering Mechanics Workshop 2	1	2
6	AS3335	Internship	2	4
7	-	Group B optional subjects	3	6
Sum of sem. 6			16	32
Semester 7				
1	AS3029	Theory of Engineering Plasticity	3	6
2	SP1037	Ho Chi Minh Ideology	2	4
3	AS3031	Non- Electric Quantities Measurement	3	6
4	AS4007	Coursework - Engineering Mechanics	2	4
5	-	Free Elective	6	12
Sum of sem. 7			16	32
Semester 8				
1	EN1003	Humans and the Environment	3	6
2	SP1007	Introduction to Vietnamese Law	2	4
3	AS4337	Capstone Project	4	8
4	-	Group C optional subjects	3	6
5	-	Free Elective	3	6

0 Appendix: Programme Learning Outcomes and Curricula

Sum of sem. 8	15	30
Total	129	258

Elective subjects:**Group A:**

1	AS2003	Programming for Engineering	3	6
2	CO1003	Introduction to Computer Programming	3	6

Group B:

1	AS3085	Computational Programming in Engineering Mechanics	3	6
2	AS3093	Applied Finite Element Method	3	6
3	AS3097	Mechanical Behavior of Materials	3	6
4	AS3149	Software Application in Computational Mechanics	3	6
5	CI3171	Mechanics of Granular Materials	3	6
6	CO2013	Database Systems	4	8
7	EE1009	Digital Designs	3	6
8	EE2019	Fundamentals of Control Systems	3	6
9	ME2013	Thermodynamics and Heat Transfer	3	6
10	ME3237	Numeric Control System	3	6
11	AS2005	Advanced Theoretical Mechanics	3	6
12	AS3001	Robot Dynamics	3	6
13	AS3003	Continuum Mechanics	3	6

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14	AS3013	Structural Analysis	3	6
15	AS3019	Analysis of Experimental Data in Mechanics	3	6
16	AS3021	Multibody Dynamics	3	6
17	AS3027	Engineering Vibration	3	6
18	AS3035	Computational Fluid Dynamics	3	6
19	AS3039	Modelling of Dynamic Systems	3	6
20	AS4003	Fracture Mechanics	3	6

Group C:

1	IM1031	General Economics	3	6
2	IM2031	Production and Operations Management	3	6
3	IM2033	Corporate Finance	3	6

2. CURRICULUM OF ENGINEERING PHYSICS PROGRAMME (EP)

No.	ID	Course's name	Number of credits	ECTS
		(English translation)		
Semester 1				
1	LA1003	English 1	2	4
2	MI1003	Military training	0	0
3	PE1003	Physical Training 1	0	0
4	CH1003	General Chemistry	3	6
5	MT1003	Calculus 1	4	8
6	PH1003	General Physics 1	4	8
7	AS1001	Introduction to Engineering	3	6

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Sum of sem. 1			16	32
Semester 2				
1	LA1005	English 2	2	4
2	PE1005	Physical Training 2	0	0
3	MT1005	Calculus 2	4	8
4	PH1005	General Physics 2	4	8
5	MT1007	Linear Algebra	3	6
6	CI1003	Engineering Drawing	3	6
7	PH1007	General Physics Labs	1	2
Sum of sem. 2			17	34
Semester 3				
1	SP1031	Basic principles of Marxism-Leninism	3	6
2	LA1007	English 3	2	4
3	PE1007	Physical Training 3	0	0
4	MT1009	Numerical Methods	3	6
5	AS2009	Fundamentals of Quantum Mechanics and Solid States Physics	3	6
6	CH2027	General Biology	3	6
7	PH2001	Fundamentals of Biomedical Engineering (BME)	3	6
	AS3081	Scientific Computing (CP)		
Sum of sem. 3			17	34
Semester 4				
1	LA1009	English 4	2	4
1	SP1033	Marxist - Leninist Political Economy	2	4
7	AS2001	Applied Mechanics	3	6
2	MT2001	Probability and Statistics	4	8

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5	EE2011	Electrical and Electronics Engineering	3	6
7	AS3069	Medical Imaging (BME)	3	6
	AS2035	Introduction to Fortran (CP)		
Sum of sem. 4			17	34
Semester 5				
1	SP1035	Scientific Socialism	2	4
4	CI2003	Fluid Mechanics	3	6
6	PH2003	Informatics for Engineering Physics	3	6
7	AS3017	Medical Instrumentation and Labs (BME)	4	8
	AS3107	Programming for Engineering (CP)		
7	AS2019	Fundamentals of General Medicine (BME)	4	8
	AS3065	Fundamentals of Computational Physics and Physics Simulation		
Sum of sem. 5			16	32
Semester 6				
1	SP1039	Revolutionary Policies of the Vietnam Communist Party	2	4
2	AS2033	Sensors and Measurement Techniques	3	6
7	AS3049	Biomechanics	3	6
	AS3057	Data Visualisation		
3	AS2045	Project of Basic Design	1	2
4	AS3089	Engineering Internship	1	2
5	AS3343	Internship (summer semester)	2	4
6	xxxxxx	Elective subjects of group A*	3	6
Sum of sem. 6			15	30

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Semester 7				
1	SP1037	Ho Chi Minh Ideology	2	4
5	AS3025	Engineering Optics and Applications	3	6
2	AS2039	Fundamentals of Nuclear Physics and Applications	3	6
3	AS3079	Project of Advanced Design	2	4
4	xxxxxx	Elective subjects of group A*	3	6
5	xxxxxx	Elective subjects of group A*	3	6
Sum of sem. 7			16	32
Semester 8				
8	EN1003	Humans and the Environment	3	6
7	SP1007	Introduction to Vietnamese Law	2	4
1	AS4343	Undergraduate Thesis	4	8
2	xxxxxx	Elective subjects of group A*	3	6
3	xxxxxx	Elective subjects of group B*	3	6
Sum of sem. 8			15	30
Total			129	258

***Elective subjects**

No.	ID	Course's name	Number of credits	ECTS
Group A				
1	AS3071	Electromagnetic Field Theory	3	6
2	AS3073	Statistical Physics	3	6
3	AS3075	Fundamentals of Lasers and Applications	3	6
4	AS3077	Fundamentals of Optical Fiber and Applications	3	6
5	AS3041	Digital Signal Processing	3	6

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6	AS3045	Laser Technology Application in Medicine	3	6
7	AS3047	Fundamentals of Biomaterials	3	6
8	AS3051	Fundamentals of Bioinformatics	3	6
9	AS3055	Digital Biomedical Image Processing	3	6
10	AS3087	Fundamentals of Biomedical Physics	3	6
Group B				
1	IM1031	General Economics	3	6
2	IM3069	Entrepreneurship	3	6
3	IM3001	Business Administration for Engineers	3	6
4	IM2003	Engineering Economics	3	6

3. CURRICULUM OF NATURAL RESOURCES AND ENVIRONMENTAL MANAGEMENT PROGRAMME (NREM)

No.	ID	Course's name	Number of credits	ECTS
		(English translation)		
Semester 1				
1	LA1003	English 1	2	4
2	MI1003	Military training	0	0
3	PE1003	Physical Training 1	0	0
4	MT1003	Calculus 1	4	8
5	MT1007	Linear Algebra	3	6
6	PH1003	General Physics 1	4	8
7	PH1007	General Physics Labs	1	2

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8	EN1001	Introduction to Engineering	3	6
Sum of sem. 1			17	34
Semester 2				
1	LA1005	English 2	2	4
2	PE1005	Physical Training 2	0	0
3	MT1005	Calculus 2	4	8
4	CH1003	General Chemistry	3	6
5	EN1015	Microbiology and Experiment	4	8
6	CI1003	Engineering Drawing	3	6
Sum of sem. 2			16	32
Semester 3				
1	LA1007	English 3	2	4
2	SP1007	Introduction to Vietnamese Law	2	4
3	PE1007	Physical Training 3	0	0
4	CH2009	Analytical Chemistry	3	6
5	MT2013	Probability and Statistics	4	8
6	EN1005	Ecology	3	6
7	EN2031	Chemistry for Environmental Engineering and Science	3	6
Sum of sem. 3			17	34
Semester 4				
1	LA1009	English 4	2	4
2	SP1031	Marxist - Leninist Philosophy	3	6
3	EN2033	Environmental Law and Policy	3	6
4	EN2035	Environmental Hydrology	3	6
5	EN2037	Environmental Processes	3	6
6	---	Elective subjects of group A	3	6

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Sum of sem. 4			17	34
Semester 5				
1	SP1033	Marxist - Leninist Political Economy	2	4
2	EN2013	Air Pollution Control	3	6
3	EN3069	Solid and Hazardous Waste Management	3	6
4	EN3071	Environmental Systems Analysis	3	6
5	EN3073	Industrial Safety and Environmental Hygiene	3	6
6	---	Elective subjects of group B1	3	6
Sum of sem. 5			17	34
Semester 6				
1	SP1035	Scientific Socialism	2	4
2	EN3003	GIS and Remote Sensing for Natural Resources and Environmental Management	3	6
3	EN3075	Water and Wastewater Treatment Technology	4	8
4	EN3047	Environmental Impact and Risk Assessment	3	6
5	EN3335	Internship	2	4
6	---	Elective subjects of group B2	3	6
Sum of sem. 6			17	34
Semester 7				
1	SP1039	History of Vietnamese Communist Party	2	4
2	EN3037	Environmental Management In Urban & Industrial Park	3	6
3	EN3039	Water Resources Management	3	6

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4	EN4023	Semester Paper	2	4
5	EN2039	Study Tour	1	2
6	---	Elective subjects of group B2	3	6
Sum of sem. 7			14	28
Semester 8				
1	SP1037	Ho Chi Minh Ideology	2	4
2	EN4025	Basic Scientific Research Methods in Natural Resources and Environmental Managem	3	6
3	EN4337	Capstone Project	4	8
4	---	Elective subjects of group B2	6	12
Sum of sem. 8			15	30
Total			130	260

**** Elective subjects of NREM**

No.	ID	Course's name	Number of credits	ECTS
Group A				
1	IM1021	Entrepreneurship	3	6
2	IM1025	Project Management for Engi-	3	6
3	IM1027	Engineering Economics	3	6
Group B1				
1	CI2001	Strength of Materials	3	6
2	CI2003	Fluid Mechanics	3	6
3	CI3281	Analysis and Design of Structures for Environmental Engi-	3	6
4	EN2017	Environmental Modelling	3	6
5	EN3011	Environmental Toxicology	3	6

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6	EN3079	Environmental Management	3	6
7	EN3081	General HSE	3	6
Group B2				
1	CI3283	Management of Urban Water Supply and Sewerage System	3	6
2	EN3023	Ecological Engineering	3	6
3	EN3043	Waste Incinerator Engineering	3	6
4	EN3083	Environmental Monitoring	3	6
5	EN3087	Climate Change	3	6
6	EN3089	Coastal Zone Management	3	6
7	EN3091	Forestry Management and Bio-diversity	3	6
8	EN3093	Soil Pollution Management and Control	3	6
9	EN3095	Environmental Economics	3	6
10	EN3097	Micro-algae: Benefit and Risk Assessment	3	6
11	EN3099	Green Technology	3	6
12	EN3101	Chemical Safety Technology	3	6
13	EN3103	Noise Control Technology	3	6
14	EN3105	HSE International Standards	3	6
15	EN3107	Project Safety Management	3	6
16	EN3109	Ergonomics	3	6
17	EN3111	Mechanical Process in Environmental Engineering	3	6
18	EN3117	Unit Operations in Environmental Engineering	3	6

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19	EN3119	Environmental Planning	3	6
20	EN3121	Conflict Management	3	6
21	---	Cleaner Production	3	6